

1. An apparatus for implementing a game, the game having a deterministic component, a rule based non-deterministic component, and a random component, the apparatus comprising:

10 a random number circuit providing an output
 signal comprising a series of uniformly distributed
 pseudo-random numbers;

buffer means coupled to receive the verified pseudo-random numbers for temporarily storing the verified pseudo-random numbers, the buffer means
20 having an output for distributing the stored verified random numbers;

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a rules library storing indexed rules for one or
more games;

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first player record to pre-selected rules in the rules library;

combinatorial algorithm storage means having a
 35 bi-directional input/output port for storing combinatorial algorithms in an executable form; and

second control means coupled to the buffer means output, the first player interface unit, the interface registry, the combinatorial algorithm
 40 storage means, and rules library, the second control means for processing the player record, the processing comprising the steps of:

(i) accepting the first player record,
 (ii) referring to the interface registry to map
 45 the first player record to a selected rule in the rules library,

(iii) executing the selected rule by selectively referring to the combinatorial algorithm storage means and selectively generating requests for sets of
 50 verified pseudo-random numbers from the buffer means output, and

(iv) generating an output record indicating results of the execution step, the output record directed to the first player interface unit.

2. The apparatus of claim 1 wherein the random number circuit comprises an ANSI X9.17 circuit.

3. The apparatus of claim 2 wherein the random number circuit comprises an international data encryption algorithm (IDEA) encryption circuit.

4. The apparatus of claim 2 wherein the random number circuit comprises a data encryption standard (DES) encryption circuit.

5. The apparatus of claim 2 wherein the random number circuit further comprises a continuously running clock circuit providing a clock output to the encryption circuit, means for providing at least one key value to the random number circuit, and means for providing at least one seed value to the random number circuit, whereby the encryption circuit encrypts the clock output using the at least one key value and the at least one seed value to provide the series of pseudo-random numbers.

6. The apparatus of claim 1 wherein the verification circuit comprises means for testing independence of the received pseudo-random numbers.

7. The apparatus of claim 6 wherein the means for testing independence uses a runs test.

8. The apparatus of claim 1 wherein the verification circuit comprises means for testing uniformity of the received pseudo-random numbers using a Kolmogorov-Smirnov test.

9. The apparatus of claim 1 wherein the verification circuit comprises means for testing uniformity of the received pseudo-random numbers using a Chi-square test.

10. The apparatus of claim 1 wherein the verification circuit comprises means for testing uniformity of the received pseudo-random numbers in more than one dimension using a series test.

11. The apparatus of claim 1 further comprising means coupled to the second control means for accepting the series of uniformly distributed pseudo-random numbers and generating a series of non-uniformly distributed pseudo-random numbers.

12. The apparatus of claim 11 wherein the distribution of the series of non-uniformly distributed pseudo-random numbers is selected from the group consisting of: a normal distribution, an exponential distribution, a Poisson distribution, a gamma distribution, and a hypergeometric distribution.

13. A system for implementing games for a plurality of players, the games having a deterministic component, a rule based non-deterministic component, and a random component, the system comprising:

a plurality of player interface units, each generating at least at least one player record of information indicating player-initiated events;

a gaming engine for implementing game rules in response to the at least one player record of information and generating random numbers required by the game rules;

a player network interface circuit coupled to communicate with each player interface unit;

a server network interface circuit coupled to communicate with the gaming engine;

a network bus coupled to the player network interface circuit and the server network interface circuit.

14. The system of claim 13, the gaming engine further comprising:

means responsive to the at least one player record for generating requests for sets of pseudo-random numbers;

a request queue storing a number of the requests for sets of pseudo-random numbers.

15. The system of claim 13 further comprising multitasking means within the gaming engine for independently and simultaneously processing each of the player records, generating output records for each of the player records, and directing the output records to the player interface units.

16. The apparatus of claim 13 further comprising:

first encryption means coupled to the server network interface circuit for encrypting information passed from the gaming engine to the network bus; and

second encryption means coupled to each of the player network interface circuits for encrypting information passed from the player interface unit to the network bus.

17. A uniform random number generator comprising:

at least one random number circuit providing a series of pseudo-random numbers on an output;

verification means coupled to receive the series of pseudo-random numbers from the random number circuit for verifying that the received pseudo-random numbers are statistically random, the verification

means having an output for supplying a series of
 10 verified pseudo-random numbers;

control means coupled to the verification means
 and the random number circuit for activating the
 random number circuit and the verification means.

18. The uniform random number generator of
 claim 17 further comprising buffer means coupled to
 the verification means for storing numbers, the
 buffer means having an input for receiving the
 5 verified pseudo-random numbers from the verification
 means and an output for distributing the verified
 stored pseudo-random numbers.

19. The uniform random number generator of
 claim 17 wherein the random number circuit comprises
 an ANSI X9.17 circuit.

20. The uniform random number generator of
 claim 17 further comprising:

at least two random number circuits, each of the
 at least two random number circuits having
 5 independent seed values and key values, the at least
 two random number circuits providing at least two
 independent series of pseudo-random numbers; and

the control means further comprises a coupling
 to each of the at least two pseudo-random number
 10 circuits for controllably coupling one of the at
 least two series of pseudo-random numbers to the
 verification means.

21. The uniform random number generator of
 claim 18 wherein the buffer means comprises a first
 in first out register.

22. The uniform random number generator of claim 18 wherein the buffer means has a storage capacity and output speed sufficient to provide bursts of the stored verified pseudo-random numbers at a rate greater than an output rate of the verification means.

23. An apparatus for implementing a game having a deterministic component and a non-deterministic component, said apparatus comprising:

- at least one player interface unit, each player interface unit generating at least player record indicating player-initiated events;
- a random number generator providing a series of pseudo-random numbers;
- a rules library storing indexed rules for one or more games;
- an interface registry for storing mapping data, the mapping data for mapping player record to pre-selected rules in the rules library;
- combinatorial algorithm storage means having a bi-directional input/output port for storing combinatorial algorithms in an executable form; and
- control means coupled to the player interface to receive the output of the player interface unit, coupled to the interface registry, the rules library, the combinatorial algorithm storage means, and the random number generator, the control means for processing the player record and returning an output record to the player interface unit.

24. The apparatus of claim 23 wherein the random number generator further comprises:

a random number circuit including an encryption circuit;

5 verification means coupled to receive the output signal from the random number circuit for verifying that the received pseudo-random numbers are statistically random, the verification means having an output for supplying a series of verified pseudo-
10 random numbers;

buffer means coupled to receive the verified pseudo-random numbers for temporarily storing the verified pseudo-random numbers, the buffer means having an output for distributing the stored verified
15 pseudo-random numbers; and

random number generator control means coupled to the buffer means, verification means, and the pseudo-random number circuit for activating the random number circuit and the verification means and causing
20 the buffer means to deliver a set of the stored verified random numbers on the buffer means output continuously.

25 The apparatus of claim 23 wherein the random number circuit includes a clock input for receiving an externally generated continuously variable signal, the apparatus further comprising:

5 means for generating a first clock signal on a clock output;

means generating a second clock signal from the time at which the player record is generated; and

means having an output coupled to the clock
10 input for receiving and combining the first and
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second clock signals ~~to~~ generate the continuously variable signal.

26. A method for generating random numbers comprising the steps of:

providing a signal comprising a continuously changing deterministic output;

5 encrypting the signal;

grouping the encrypted signal into sets of raw pseudo-random numbers; and

10 verifying that the raw pseudo-random numbers comprise independent, uniform, sets of statistically pseudo-random numbers.

27. The method of claim 26 further comprising:

temporarily storing the verified pseudo-random numbers in a buffer; and

5 distributing a portion of the stored, verified pseudo-random numbers from the buffer in response to a request from a device external to the random number ~~generator.~~

28. A method for implementing a game, the game having a deterministic component, a rule based non-deterministic component, and a random component, the method comprising the steps of:

5 generating at least a first player record of information indicating a player-initiated event from a first player;

generating a signal comprising a series of uniformly distributed pseudo-random numbers;

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temporarily storing the verified pseudo-random numbers;

providing a rules library storing indexed rules
for one or more games;

processing the player record, the processing comprising the steps of:

(ii) executing the selected rule by selectively referring to the combinatorial algorithm storage means and selectively generating requests for sets of verified pseudo-random numbers from the buffer means output, and

(iii) generating an output record indicating results of the execution step, the output record
35 directed to the first player interface unit.

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